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City of Dover, New Hampshire

Department of Planning & Community Development

MEMORANDUM

TO: **Transportation Advisory Commission Members**

FROM: **Planning Staff**

DATE: **November 16, 2004**

SUBJECT: **Back Road Reconstruction design and process recommendations**

The Planning Department is concerned by the reconstruction design for Back Road that plans for 24 ft. wide pavement and vertical and horizontal roadway realignment to straighten the road and smooth the hills.

The proposed 24 ft. wide paved width brings the pavement right up against several utility poles. Despite the fact that the fog (white) line would be two feet from the edge of pavement, the proximity of the poles is a safety concern. This concern, in our opinion, will lead to the eventual moving of the poles and lines back from the roadway, which will in turn necessitate more extensive tree cutting and/or thinning in a scenic area.

The cuts and fills required to smooth the road vertically will have a compromising effect on historic stone walls because the gravel sub base shoulder will touch the walls above their current grade.

The aspect of road-widening, straightening and smoothing will have the effect of increasing the “ease of movement” by cars. This “ease of movement” quality allows vehicles to get to their destinations faster and easier. There are other qualities that make a street livable that may well be more important to drivers and residents alike. They are; safety from traffic, peace and quiet, attractive appearance (cultural and scenic), and street life. The cultural and scenic qualities of Back Road will be compromised with implementation of the current design.

Planning staff have conducted extensive research into this issue. The issue of whether the AASHTO Green Book (Policy on Geometric Design of Highways and Streets, 1990) is an absolute design standard or a guideline that may be modified to account for the scenic, historic, cultural and preservation aspects of the Back Road area is answered in the affirmative by the attached excerpts from the AASHTO Green Book, Flexible Design Standards, the State of Vermont Local Roads and Streets Standards, Federal Highways Administration's Flexibility in Highway Design, and Transportation Demand Management Encyclopedia's Context Sensitive Design document. Please review each of these excerpts as you consider your recommendation.

An analysis of the potential build-out of undeveloped acreage was also prepared. Please refer to the attached Back Road Build out spreadsheet attached. From the data, 144 potential house lots may be expected to be developed over the next twenty plus years. This value can more realistically be reduced to 100 when given the fact that two large parcels are currently being considered for permanent protection from development through the Open Lands program. At ten vehicle trips per single family dwelling, (at the more likely value of 100), plus the current average daily count of 488, the average daily vehicle count on Back Road at build out can be expected to carry less than 1500 vehicles per day. This number at build out does not change the road's designation from rural local collector. This is important because some states have directly related the functional classification of the road to the level of development or design criteria. This functional classification corresponds to a "maintenance of structural integrity and operation safety" design criteria designation. In effect, design criteria should be tailored to fit the character and usage of the road in context with the surrounding area.

Staff also collected data on road widths of similar facilities in the City. Six roads were measured that had pavement widths of between 16 ft. and 23 ft. All six roads carry an equivalent or higher number of vehicles per day as Back Road from historic counts and appear to be relatively safe facilities. Refer to the attached matrix for the streets, segments and widths. Back Road does not have to be widened to be safe. Widening increases predictability, thereby increasing vehicle speeds. Safety can be accomplished by a design that signals that the road space is unpredictable (i.e. curves, hills, tree ceilings, and neighborhood life at the street transitions) and therefore reduces vehicle speeds. Low volumes combined with lower speeds contribute to a safe roadway even at current pavement widths and alignment.

The Police Department collected vehicle counts and speed data on the improved section and on the unimproved section of Back Road during a twelve day period ending on November 15, 2004. An important conclusion after comparing the data is that the average speed on the improved section is 3 MPH faster than on the unimproved section (34 vs. 31 MPH), and that 39% of the vehicles on the improved section were traveling 36 MPH or faster, while only 19% of the vehicles were traveling 36 MPH or faster on the unimproved section of Back Road. The higher average vehicle count on the improved section can be attributed to the trip

generation and desire line trips to and from the Mallard Drive subdivision near the end of that section.

The Police also collected accident data for the four year period between August 2000 and August 2004. There were 16 accidents during that timeframe. Several of those occurred during the winter condition months of the year, one was a DWI, two were caused by the avoidance of animals, one was a commercial truck loading accident, and one was a rear end at Middle Road. Only five of the total were accidents caused by unreasonable speed, and that number was spread out over three year period. Refer to the attached accident data sheet.

In the final analysis, the AASHTO Green Book is a set of design guidelines, not a set of regulations. The City is not dealing with constructing a new road, but rehabilitating an existing one to enhance its operation and maintenance aspects. We should not be rebuilding it to carry more vehicles, higher classifications of vehicles or for higher speeds (but the design does just that). Finally, everyone's best interests should take into account more than just transportation needs (ease of vehicle movement), especially in the Back Road context, where cultural, historic and scenic interests all compete to be at a similar level with the transportation needs of drivers with through destinations.

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After a thorough review of the existing conditions along Back Road, extensive research, data-gathering and analysis, following is the Planning Department's recommendation with regard to Back Road and the public participation process for similar future projects:

1. Construct a 22 ft. wide pavement with appropriate roadway slope for positive drainage to include 2 ft. wide gravel (sub-base) shoulders in the existing roadbed (same horizontal and vertical alignment as existing) except in those areas drainage improvement require said changes.
2. Do not stripe the roadway. Review the results and reassess the effectiveness after a period of six months.
3. Implement a vegetation management program.
4. Install two signs at each end of the scenic portion of Back Road that cautions vehicles about the scenic aspects, severe curves and non-standard sight distance. This, coupled with the road surface and drainage improvements address the "due care" mandate for engineers since the entire plan dramatically improves the current condition.
5. The City should develop standard public participation process for projects of this type.
6. The City should develop design standards to be applied to rural, scenic and low volume existing streets that require reconstruction and rehabilitation.